Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

76 gluttons, 240 otters, 143 martens, 1583 ermines and 3947 carnivorous birds were killed and paid for by the Government. The losses during the same year from Carnivora were estimated at 274 horses, 846 cattle, 5246 sheep, 168 pigs, 119 goats, 1681 reindeers and 2366 chickens.

Crustacea.—The Crustacea of the Norwegian North Atlantic Expeditions, excluding forms previously established as belonging to the Norwegian littoral fauna, have been described by G. O. Sars. They comprise: Brachyura, 1 sp.; Anomoura, 1; Caridea, 4; Mysidæ, 5; Cumaceæ, 1; Isopoda, 18; Amphipoda, 45; a copepod, *Eucheta norvegica*, always found at considerable depths, six cirripeds and *Stylon hymenodore*, a rhizocephalon attached parasitically to the abdomen of *Hymenadora glacialis*, and dredged in 1861 fathoms.——*Bythocaris leucopis* and *payeri*, true deep-sea carideans of the North Atlantic (1110 fathoms), do not pass through the usual larval stages, but on quitting, the remarkably large embryos have the full number of appendages found in the parent. *Hymenodora glacialis* has an exopodite attached to the outer side of the second joint of the legs, as in the schizopods.——*Boreomysis scyphops*, a schizopod taken by the Norwegian North Atlantic expedition has very singular eyes. The outer surface of these organs is concave, they are attached close together, and are destitute of any specific ocular pigment.——*Sphyrapus serratus* Sars, is a singular sightless isopod which occurs in the open sea between Norway and Iceland, at depths of from 1163 to 1333 fathoms. It has nineteen paired appendages. The first pair of legs springing from the posterior part of the cephalic segment, are powerful prehensile organs. The second pair of legs are as long as the body, flattened, and armed with powerful spines. Five pairs of slender walking feet follow, and are followed by five of biramous swimming feet and a pair of long branched and many-jointed caudal appendages.

EMBRYOLOGY.[1]

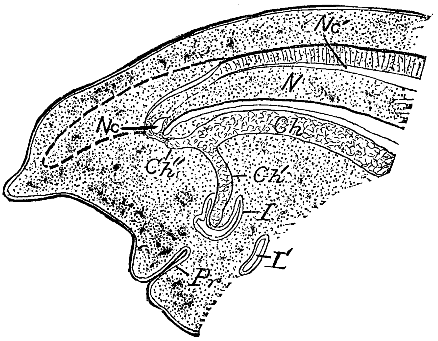
On an Unusual Relation of the Notochord to the Intestine in the Chick.—Through the great kindness of Dr. G. Baur, of the Peabody Museum, New Haven, Conn., I am enabled to figure an apparently rare mode of development of the notochord in the embryo chick. In order to enable the reader to more readily understand the peculiar morphological relations to each other of the posterior ends of the nervous cord, chorda and intestine in the series of sections prepared by Dr. Baur, I have endeavored to combine in one figure what seemed to me to be a correct interpretation of the relations of the parts involved.

The series of sections loaned me and from which I am kindly permitted to figure such portions as are of interest in this connection, were prepared from an embryo of the seventh day. The sections consist of a vertical longitudinal series, which show the structural details represented in the accompanying figure, drawn with the aid of the camera lucida.

---

[1] Edited by John A. Ryder, Smithsonian Institution, Washington, D. C.

The most striking feature is the condition of development presented by the notochord *Ch*, which bifurcates posteriorly into two branches, namely, a ventral one, *Ch'*, and a posterior or dorsal one, *Ch''*. The ventral branch *Ch'* is in close relation to the hindermost portion of the mesenteron *I*, while the posterior or dorsal branch *Ch''*, which really seems to be the posterior continuation of the chorda proper, is closely connected with the under side of the hinder portion of the nervous cord *N*. In fact, there is a readily traceable bridge of tissue between the end of *Ch''* and the under side of *N*, which conclusively demonstrates that these two structures were at an earlier stage continuous. Just above this bridge of tissue there is a cavity, *Nc*, which must in all probability be regarded as a persistent portion of the neurenteric canal, which has been dilated into a vesicle at this point. Certain sections of this series, from a slightly different plane, show that the nervous cord *N* extended back somewhat beyond the point where the notochord joined it, as shown by the dotted outline in the figure. The notochord itself, however, I cannot trace farther back than is shown in the figure, though there are somites developed beyond its termination.



Explanation of Figure.—*Ch*, chorda dorsalis; *Ch'*, portion of chorda developed about the ventral end of the neurenteric canal; *Ch''*, hinder portion of chorda joined posteriorly to the medulla spinalis *N*; *Nc*, vesicular cavity just above the point of union between the medulla spinalis and chorda, and representing a dilatation of the neurenteric canal; *Nc'*, medullary canal; *I* and *I'*, posterior part of mesenteron; *Pr*, proctodæum. × 21.

Judging from what has preceded, it is evident that a connection between the central neural canal *Nc'* and the developing chorda and intestine once existed in this embryo. The central canal *Nc'* is, I believe, traceable to the cavity *Nc* farther back, just below which the neural tube is continuous with the chorda. It seems, in fact, not improbable that the single point of connection between the chorda and nervous cord represents the atrophied neurenteric canal, and that the portion of it which joined the intestine passed down through *Ch''* and *Ch'*. Even supposing that the condition of things observed in this particular embryo is not normal, it is easy to conceive that this specimen may represent a palingenetic type of avian development, comparable with such an one as has been described by Hoffmann[1] in *Anas boschus*, in which the canalis neurentericus is shown (pl. III, fig. 5) to open into the intestine while a canal also extends from it anteriorly into the chorda itself. Such is essentially the arrangement in the specimen here described, except that the chorda has been differentiated along the entire extent of the neurenteric canal.

The arrangement of parts in the more advanced duck embryo figured by Balfour (Comp. Embryol., II, p. 136), is likewise reconcilable with that observed in the preparations made by Dr. Baur. In Balfour's account of the development of this region in the duck, the condition which has persisted in the specimen here under consideration has been described. He says: "The [neurenteric] passage leads obliquely backwards and ventralwards from the hind end of the neural tube into the notochord, where the latter joins the primitive streak. A narrow diverticulum from this passage is continued forwards for a short distance along the axis of the notochord. After traversing the notochord, the passage is continued into a hypoblastic diverticulum, which opens ventrally into the future lumen of the alimentary tract." It is clear from the figure that this must have been the case in the specimen here under consideration; that is, the neurenteric passage about which notochordal tissue was differentiated was continued forward into the chorda, as the latter was folded off from the hypoblast, and that from this passage in the chorda one passing downward to the intestine was given off about which notochordal tissue was also differentiated.

While it is highly probable that this embryo chick displays an archaic development of the chorda, yet the facts are significant, especially when viewed in the light of the interpretations of Ehlers as to the significance of the "*Nebendarm*" in the invertebrates. This specimen shows that what must have been a part of the neurenteric canal during an earlier stage, *i. e.*, *Ch'*, has been actually differentiated into a structure histologically identical with the true axial notochord *Ch.*

This specimen is therefore of great interest, since it demontrates, if we may regard it as representing a palingenetic condition of development, that the chorda dorsalis was primitively in absolute continuity with the intestine (mesenteron) posteriorly, and that there may therefore have been primitive Chordata in which the chorda was usually developed as such, in almost absolute continuity with the alimentary tract.—*John A. Ryder.*

PROFESSOR SELENKA ON THE DEVELOPMENT OF THE OPOSSUM (DIDELPHYS VIRGINIANA). — The following short notice of the recent investigations of Professor Emil Selenka, of Erlangen, on the development of the common opossum, although it has appeared some time since in a foreign journal,[1] seems to us of such unusual interest that we render in English the author's text in full as follows:

---

[1] Die Bildung des Mesoderms, die Anlage der Chorda dorsalis und die Entwickelung des Canalis neurentericus bei Vogelembryonen. Naturk. Verh. der Koninkl. Akad. Wetensch. XXIII, Amsterdam, 1883.

"For a number of years I have been intending to trace more accurately the development of some marsupial. The study of this archaic group promises to clear up a number of problems which the study of the embryology of placental mammalia has given rise to, but which that study has hitherto not been in a position to solve, such, for example, as the significance of the peculiar mode of development of the germinal layers in the Placentalia, the conversion of the transitory respiratory organs into an apparatus for the nutrition of the embryo, and further, the higher differentiation of certain organs (the brain, auditory apparatus, diaphragm, etc.)—questions, the solution of which may at the same time explain the origin of the Mammalia.

"During my stay in Brazil (there at that time winter), I found that no sexually mature marsupials were to be had, and since I could obtain but little material, and only such as was unsuitable at that, from the zoölogical gardens of Holland and Germany in the course of years, I resolved to attempt to rear these animals at Erlangen.

"More than two years since, I obtained eight young Brazilian opossums, which promised to do well, but all of which died, one after the other, before they were full grown. Last autumn, however, I obtained, through the kind efforts of Mr. Karl Hagenbeck, of Hamburg, a large number of the hardy North American opossum; in a warmed and well-ventilated stable, these animals, which were well fed, survived the winter remarkably well, and all of them, except a few individuals which were suffering from an affection of the liver and spleen, began rutting during the past spring. Seven females furnished within a few weeks about one hundred embryos, representing the greatest range of stages of development. To obtain such favorable results, various methods of artificial interference had to be resorted to, a description of which is not in place here. Nor would I anticipate the complete account which will appear in the course of the present year, so that I shall now only record some observations on the rutting of these animals and the development of the blastodermic vesicle.

"1. In each spermatoblast of the male, two spermatozoa are developed, which, however, remain united for a remarkably long period. The mature spermatozoa, which are taken from the vagina of the female immediately after copulation, are almost all such twin-cells with double flagella; only after some time do they separate as a consequence of the remarkably strong and rapid vibrations of the flagella—they are literally thus torn apart.

"2. The rutting period of the female occurs at night and during the morning hours and lasts only half a day. If copulation does not take place during this period, the female may rut again in the course of several weeks. Such females also from which the young are prematurely removed from the pouch or marsupium, allow themselves to soon again become pregnant. During the rutting period the walls of the uterus thicken very perceptibly, and principally because of the enlargement of the uterine lymph-spaces, in which the uterine glands then appear to be suspended and to float.

---

[1] Ueber die Entwickelung des Opossums (*Didelphys virginiana*). Biolog. Centralblatt, v, No. 10, 1885, pp. 294–295.

"3. The fertilization of the eggs always occurs five days after copulation and at the lower end of the oviduct, where the latter widens into the uterus. In the vermicularly bent oviducts no spermotozoa are encountered.

"4. Gestation lasts for exactly eight days; then thirteen days after copulation the young are transferred to the marsupium. Development accordingly proceeds with extraordinary rapidity. Only three days before birth do the amniotic folds close over the back of the embryo.

"5. The egg is intermediate in character between the meroblastic and holoblastic type. During segmentation, there is aggregated at the aplastic pole of the egg a nutritive yolk, which at first lies quite outside of the ectoderm, though three days later the neighboring ecto- and mesodermal cells grow over the yolk, which thus becomes surrounded or imbedded by them, but the yolk is never included by the umbilical vesicle (intestinal or entodermal cavity)! Remnants of the yolk persist up to the third day before birth.

"6. The fertilized but unsegmented egg measures almost $.5^{mm}$ in diameter; in the course of twenty-four hours the blastodermic vesicle measures 1^{mm}; in thirty-six hours 1.5^{mm}; in sixty hours 4^{mm}; in seventy-two hours 8^{mm}; in ninety-six hours 14^{mm}, and on the sixth day after the commencement of segmentation as much as 20^{mm} in diameter.

"7. The blastodermic vesicles at first lie quite free and scattered in the uterus; on the fourth day (after the beginning of segmentation), the blastodermic vesicle over the germinal area becomes very loosely adherent to the uterine epithelium.

"8. In the marsupium of the mother there were never more than six young observed. But the number of embryos [found in the uterus] is invariably much greater and varies, according to the size and strength of the female, from nine to twenty-seven."

PHYSIOLOGY.[1]

THE ACTION OF SULPHATE OF SPARTEINE ON THE HEART.—The alkaloid sparteine was discovered by Stenhouse in *Spartium scoparium*, a species of Genista, in 1850. It is a bitter liquid, insoluble in water. Treated with an excess of sulphuric acid, it forms a

---

[1] This department is edited by Professor HENRY SEWALL, of Ann Arbor, Michigan.